WHAT IS CLAIMED IS:

1. A medical laser apparatus comprising:

a solid laser oscillating source which emits a beam of a wavelength λ1 in an infrared region of approx. 1040 nm to approx. 1080 nm;

a first fiber-based Raman shifter including a first Raman fiber which generates, when receives the λ1-beam from the laser oscillating source, a first-order Stokes beam of a wavelength λ2 different from the wavelength λ1 by stimulated Raman scattering, the first Raman fiber being formed with a pair of fiber Bragg gratings which forms a resonator for the λ2-beam;

a first nonlinear crystal which wavelength-converts the λ2-beam outputted from the first Raman wavelength shifter to a second harmonic beam of a wavelength λ2' in an orange region of approx. 580 nm to approx. 600 nm; and

a light guiding optical system which guides the λ2'-beam to a treatment part.

2. The medical laser apparatus according to claim 1, wherein the Raman fiber includes a silica(SiO_2)-based optical fiber doped with titanium oxide (TiO_2).

3. The medical laser apparatus according to claim 1, further comprising:

a second nonlinear crystal which wavelength-converts the λ1-beam from the laser oscillating source to a second harmonic beam of a wavelength λ1' in a green region of approx. 520 nm to approx. 540 nm;

an input switching unit which selectively switches input of the λ1-beam from the laser oscillating source into between the second

nonlinear crystal and the first Raman wavelength shifter; and

an output switching unit which selectively switches between output of the λ1'-beam from the second nonlinear crystal to the light guiding optical system and output of the λ2'-beam from the first nonlinear crystal to the light guiding optical system; and

wherein the light guiding optical system is also adapted to guide the λ1'-beam to the treatment part.

4. The medical laser apparatus according to claim 1, further comprising:

a second fiber-based Raman shifter including a second Raman fiber which generates, when receiving the λ1-beam from the laser oscillating source, the first-order Stokes beam of the wavelength λ2 and further a second-order Stokes beam of a wavelength λ3 different from the wavelengths λ1 and λ2 by the stimulated Raman scattering, the second Raman fiber being formed with two pairs of fiber Bragg gratings which form resonators for the λ2-beam and the λ3-beam, respectively;

a third nonlinear crystal which wavelength-converts the λ3-beam outputted from the second Raman wavelength shifter to a second harmonic beam of a wavelength λ3' in a red region of approx. 610 nm to approx. 630 nm;

an input switching unit which selectively switches input of the λ1-beam from the laser oscillating source into between the first Raman wavelength shifter and the second Raman wavelength shifter;

an output switching unit which selectively switches between output of the λ2'-beam from the first nonlinear crystal to the light guiding optical system and output of the λ3'-beam from the third nonlinear crystal to the light guiding optical system; and

wherein the light guiding optical system is also adapted to guide the λ3'-beam to the treatment part.

5. The medical laser apparatus according to claim 4, wherein the second Raman fiber uses at least a part of the first Raman fiber in common.

6. The medical laser apparatus according to claim 3, wherein the input switching unit and the output switching unit include a fiber switch.

7. The medical laser apparatus according to claim 4, wherein the input switching unit and the output switching unit include a fiber switch.

8. The medical laser apparatus according to claim 1, wherein the laser oscillating source includes an Nd:YAG laser, an Nd:YLF laser, or a Yb-doped fiber laser.